all. Tenderness was general in 5 cases and limited to the lower right abdomen in 3. Rectal examination revealed tenderness in the 7 cases in which it was made. The leukocytes in 4 cases were 4000, 7200, 10,000, and 18,000. The diagnosis was made in 5 cases, and the incision was made in the right iliac region; in 3 cases a diagnosis of perforative peritonitis was made and the abdomen opened in the middle line. The perforations were situated in the ileum within three feet of the cæcum in all cases, and varied in size from a pinhole up to one-half inch in diameter. In 1 case there were two perforations. Fecal matter was present in the peritoneal cavity in all except 1 case, in which the fluid was clear and in which recovery ensued. The peritoneum was inflamed in all but 1 case, in which recovery ensued. Mesenteric glands were enlarged in all. In only 1 case was it necessary to tear through adhesions to find the perforation. In all cases a double row of continuous Lembert suture of silk was employed. All were drained with gauze, surrounded by a rubber dam, except 1 (recovered); in 1 case (died) in addition to the gauze drainage in the primary incision a rubber tube was brought out through the loin. Ether was used as an anæsthetic in all cases except 1, in which the operation was performed under cocaine. 5 of the cases were admitted to the hospital immediately before operation, and 2 walked about until the time of perforation. 2 recovered, 2 died of typhoid (?), and 4 died of peritonitis.

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PAROTITIS COMPLICATING APPENDICITIS.[1]

By F. E. Bunts, M.D.,
OF CLEVELAND, OHIO.

The first reported instance of parotitis as a postoperative complication of appendectomy is that reported by Barlow, in 1886, who, in a male aged twenty years, reports the occurrence of a parotid bubo, "which did not suppurate." In the operation, collections of fetid pus around the cæcum had been found. The appendix vermiformis was noted to have been much thickened, but apparently it was not removed. Elder and Thomas next, as recently as 1901, each mentions the occurrence of parotitis as a sequel to appendicitis. In Elder's case, a male aged twenty years had a sudden onset of pain in the right iliac region. The operation revealed pericæcal abscess. Three days after the operation the temperature began to rise, and a stiffness and swelling in the right parotid region, with intense pain, appeared. "The swelling rapidly increased for about ten hours, when the pain subsided. At this time the whole parotid region and the upper part of the neck were enormously swollen, the swelling coming forward over the cheek and involving the eyelids, especially the under one. Thirty-six hours after the left parotid began to swell in the same way, while the right parotid began slowly to decrease. The left parotid attained almost exactly the same size as the right, and the temperature reached 103° F. The swellings were very painful to pressure, but there was no indication of suppuration in either of them. The second parotid reached its maximum in about twelve hours after it showed symptoms of enlarging." Both parotids gradually subsided, and recovery followed. As a probable etiological cause in this instance, infection is suggested.

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In Thomas' case, that of a young woman aged twenty-two years, the appendix was found adherent to the pelvic bottom, but no suppuration was present. Six days after the operation a parotitis developed on the right side, which was extremely painful and persisted for ten days, then subsiding without suppuration.

In these three instances of postoperative parotitis following appendectomy are to be found the only records of this complication subsequent to this operation. As noted, in two, suppuration occurred, while in one of these a septic condition was presumably not present. To these three cases I wish to add three others which have come under my own observation.

Case I.—Male, aged twenty-nine years, entered Charity Hospital May 12, 1902, with severe attack of appendicitis. Patient refused operation, and a large mass formed in the right side. All food was withheld from the stomach, and feeding was carried on exclusively by the rectum. In about seven days, when the general symptoms were improving, though the tongue remained dry and hard, he developed a tenderness over the right parotid. Ichthyol and hot fomentations were applied, suppuration occurred, and the abscess was opened May 24th. The left parotid up to this time had not been involved, but in a few days became inflamed, suppurated, and was opened May 28th. The pus was at first very thick and white, but later it became thin, the drainage was better, and they slowly healed. The mass entirely disappeared, and the patient was discharged June 27th, entirely recovered. He was seen at the expiration of one year and had had no recurrence of the trouble.

Case II.—Male, aged twenty-nine years, entered Charity Hospital January 28, 1903, with an attack of acute appendicitis, this being the fifth attack within the past year. At this time the patient had a mass in the right side, and vomited severely, apparently obstruction of the bowels. Immediate operation revealed abscess cavity and gangrenous appendix, peritoneal cavity well walled-off. Appendix was removed and wound drained. No movement of the bowels was obtained until the second day. He suffered from great pain and extreme distention of the abdomen, and was allowed nothing by mouth but hot water and occasionally a little beef broth. About February 6th he developed a right parotitis, which slowly went on to suppuration, and was opened. In two or three days the left parotid became involved, and though greatly swollen and very painful, never had to be opened, but was treated with local applications of ichthyol and moist heat. The bacteriological examination showed a pure culture of bacillus coli communis from the appendiceal abscess and staphylococcus pyogenes aureus from the parotid abscess. Patient discharged cured March 25th. At no time did the parotid inflammation appear to threaten the life of the patient, and in the one which suppurated, recovery followed fairly rapidly upon its evacuation.

CASE III.—Female, aged sixty-two years, admitted to Mt. Sinai Hospital July 16, 1903, had been sick for one week, suffering intense pain in abdomen, especially in the right iliac region, had severe diarrhœa, brought on by purging, vomited frequently, abdomen markedly distended, large mass in the right iliac region. Diagnosis, appendicitis. No operation was performed; patient was allowed only water by the mouth, and was fed by the rectum, and ice-bags applied to the abdomen. Under this treatment the fever gradually declined until July 22d, when it reached normal, and remained, with slight variation, at that point till July 26th, when it rose to 100.4° F. Coincidently there was a beginning tenderness of the left parotid, which increased greatly in size, the swelling extending back of the ear and well down on the neck. On account of the pain and swelling she could only separate her jaws about one-quarter of an inch. The tongue was very dry and hard. Five days later, under local anæsthesia, the parotid was opened and a small amount of very thick pus escaped. The pus was so thick that for several days the flow was much impeded. By July 30th the temperature was again normal, but August 2d it rose to 100° F., and a beginning parotitis of the right side was discovered. This was treated as was the first, by local applications of ichthyol and hot fomentations. The tongue remained dry and harsh, the jaws almost entirely closed, but the inflammation gradually subsided without evidence of suppuration, and the patient's general condition improved very markedly till August 9th, when she complained of some pain and discomfort in the right iliac region. The mass had disappeared after a week's confinement to rectal feeding, and was not again present, but the temperature rose to 101.4 F., and then gradually resumed the normal, remaining there for several days prior to her death on August 21st. No autopsy was permitted, so that the exact cause of death was not known. Both parotids had, however, entirely recovered. There was no evidence of metastatic processes, but the condition seemed to be rather one of low sepsis and exhaustion.

The records of these cases, especially the bacteriological findings, are unfortunately incomplete, but in the second case, or the only one in which an operation was performed and an opportunity given to compare the bacteriological cause of the appendicitis and also of the parotitis, the examination showed colon bacilli in the one and staphylococci in the other, thus showing the improbability of its being metastatic in its origin, and in all three cases both parotids became entirely well and no metastasis developed, and aside from the additional debility or exhaustion which ensued, the parotitis did not seem to be *per se* a serious complication.

Since the completion of this paper the following report of a case of parotitis complicating appendicitis has been kindly given me by my colleague, Dr. C. A. Hamann:

E. R., aged twenty years; operation on November 23, 1901. Three weeks before operation was attacked with usual symptoms of acute appendicitis. Condition at time of operation: Large tender mass in median line of abdomen, below and to left of the umbilicus, plainly to be felt per rectum; fluctuation not to be determined, temperature, 101° F.; pulse, 92; leukocytosis, 27,000. Incision in median line. Abscess cavity contained about one pint of pus, walled off. Pus had a fecal odor. Bacillus coli communis found. Appendix could not be found. On November 28th the left parotid region was greatly swollen; œdema over gland; pain; temperature, 102° F. November 29th, incision; no pus evacuated. December 4th, another incision; much pus; About this time the right parotid became enlarged. Soon pus appeared in the external auditory canal. December 7th, incised right parotid; much pus; bacillus coli communis and staphylococci found in pus from parotids. Patient progressed gradually to complete recovery. Discharged from the hospital January 4, 1902.

It will be noted that in this case the colon bacillus, as well as staphylococci, were found in the examination of the pus obtained from the parotid, but no other evidence of metastatic infection appeared, and the patient eventually made a favorable recovery.

The occurrence of parotitis as a sequel or complication of various operations and diseases, though known and described by many clinicians, is still of interest and of importance, and while the object of this paper is to emphasize the possibility of its occurrence in appendicitis, it is also my desire to refer as briefly as possible to a number of cases which have been from time to time reported and the theories which have been advanced to account for them.

Parotitis as occurring subsequent to abdominal sections has been most frequently noted in relation to ovariotomy. Goodell, in a series of 153 ovariotomies, noted its occurrence in 4 cases, in only 1 of which did suppuration occur. Moricke, in 200 ovariotomies, observed 5 cases, 4 of which suppurated. Paget, in a collection of 101 cases of parotitis, the result of injury, either traumatic or operative, to the abdomen or pelvis, reports that in 27 it was the sequel to ovariotomy or oöphorectomy. In 90 of these cases both parotids were attacked, and in 3 the submaxillary and sublingual glands were also involved. Brunne, in a report of 17 cases of parotitis supervening upon ovariotomy, reports that in 4 cases it was bilateral, while in 9 cases suppuration occurred.

From this great preponderance of parotitis subsequent to ovariotomy it was at one time assumed that it occurred only in this operation to the exclusion of all others. Moricke asserted that he had never observed this complication in any other laparotomy excepting that involving an ovariotomy. This statement was, however, soon contradicted by more accurate observations, and other operations followed by this complication were soon reported.

According to McDonald, parotitis was not an unusual or uncommon complication in the early history of abdominal surgery, it being regarded by some surgeons as invariably fatal. This statement regarding the fatality of postoperative parotitis was seemingly substantiated by Moricke, who also regarded the parotitis following ovariotomy as a severe complication, stating that in 2 cases it was seemingly the sole cause of death, and in 2 cases it at least contributed to the fatal issue.

As to the etiology of postoperative parotitis, the theory which was primarily advanced assumed the sympathetic relation between the generative organs and these glands. This theory, which gained some corroboration from the frequent occurrence of orchitis or mastitis following the so-termed mumps of childhood, was apparently even more strongly verified by some peculiar instances of parotitis following injuries or operations on these organs.

In the male sex parotitis had been observed secondary to injury of the testicle (Billroth, Hutchison), after the passage of the catheter (O'Conner, Crimm, Paget), as also subsequent to cystitis (Paget). In the female sex, however, parotitis had been even more frequently observed in the various affections of the generative organs. Peter, in a woman with irregular menstruation, speaks of the substitution of the menses by parotitis of either one side or the other, most frequently the left. Hawkins mentions the instance of a woman who, during six successive pregnancies, had an enlargement of the left parotid, which increased with the advance of gestation, and totally disappeared after delivery. He states that "she had learned to recognize this as one of the first indications of her condition." Cribb, in connection with the interrelation of parotitis and the sexual organs, speaks of an instance in which parotitis followed the insertion of a pessary in the vagina. Parotitis following delivery, abortion, and the menopause, has also been mentioned by other observers, also as a sequence to operative procedures on the generative tract, as has been observed after the excision of the cervix, uterus (Goodell), the repair of a lacerated cervix (Emmet), the repair of a vesicovaginal fistula (Emmet), abdominal hysterectomy (Krussen, Ross, Baldwin, McDonald), salpingectomy (Ricketts), perineorrhaphy (Auld), myoenucleation of the uterus (Gotschauer).

In the frequent observance of parotitis as resulting from disease, injuries, or operations upon the sexual organs, the sympathetic bond between these respective organs seemed assured, even although a more or less direct anatomical connection could not be determined. Trousseau already referred to it in a vague manner. Brunn advanced the explanation that stimuli were transferred from one organ to the other by means of certain nerve channels. In this way irritation in operations on the ovary was said to cause vasomotor disturbances in the parotid gland, from which an inflammation soon followed, which at the onset was assumed to be simple. If suppuration subsequently occurred, this was supposed to be the result of micro-organisms, whose portal of entrance was through Stenson's duct, the partial suspension or inhibition of the salivary secretion being considered a most favorable and influential factor for the admission of the micro-organism.

Paget similarly assumed a nervous relation, although he, too, could advance no more definite statement as to the nature of the relation. The assumption of Paget was largely based on instances of persistent alteration of the parotid gland of both a physiological and clinical nature. In the dog, for instance, the action of the gustatory nerve is known to suffer inhibition when a loop of intestine is drawn from the abdominal cavity, and the secretion of saliva is thereby diminished or totally arrested until the loop of the intestine is replaced. Clinically, he states, arrest of saliva has also been observed during gastritis, as also during menstruation, while in pregnancy salivation is a common occurrence.

This influence of the nervous system on the salivary glands is said to be both direct and reflex. In all of these assumptions a clear elucidation of the exact anatomical and physiological interrelationship of these organs to either the nervous system or to the parotid gland seemed lacking, so that they presented but little which could logically commend itself. With more accurate observations on this form of parotitis it was also found that the affection was not entirely limited to operations upon the sexual tract, but occurred after other cœliotomies and operations. In the report of such instances it had been noted as a sequel to gastrectomy (Clark), gastrostomy (Paget), enterostomy (Dunkworth), colostomy (Dashwood, Rosenbach), laparotomy for peritonitis (Goode, Addenbrook), partial removal of the omentum and retroperitoneal tumor (Paget), operation for gastric ulcer (Hawkins and Herbert), as well as after a division of a rectal stricture and excision of hemorrhoids (Paget, Auld), and after an amputation of the leg (McDonald), so that the statement that parotitis following operation is confined exclusively to operations upon the generative tract is no longer valid, and the theories which had been advanced were changed to include all interference upon the peritoneal cavity. A definite relation identical to that which had been theoretically applied to the ovaries was, however, assumed to exist between the peritoneum and the parotid gland.

In this connection Brunn mentioned that in the cases of parotitis following ovariotomy which he had observed this seemed to be most frequent when multiple adhesions between the viscera were encountered. To explain the occurrence of parotitis subsequent to laparotomy or operative interference in the peritoneal cavity in general, a new theory, however, soon came in, viz., that of direct metastasis. As has been frequently stated, parotitis was more apt to result if purulent foci were encountered in the course of the operation subsequent to peritonitis, pyæmia, appendicular abscess, etc., than after non-septic cœliotomies.

Pozzi regarded the occurrence of parotitis after cœliotomy as strong evidence of the fact that a certain degree of septicæmia was present. In general, however, the theory of metastasis where no purulent affections and septicæmic processes were present could not be regarded favorably. Among later writers this theory too has been discarded, as it could not logically be assumed that septic metastasis should involve the parotid gland to the exclusion of all other organs. The more rational view that parotitis was to be associated with an ascending infection from the mouth along Stenson's duct began to prevail, and the clinical facts, when carefully considered, in part if not wholly, served to substantiate this view. Certain predisposing factors favoring the ascending infection along the course of Stenson's duct were soon determined to be present in the instances in which parotitis supervened. Among the most influential of these is the dryness of the mouth, which may supervene after operations and in conditions of enjoined rest of the patient. Contributory causes are the stagnation of the saliva and the injury to the duct in the course of the operation. That dryness of the mouth predisposes to a parotitis has been attested by clinical observations of various writers.

In the affection termed erostomia the occurrence of repeated attacks of parotitis has not been infrequently noted (Hutchison, Harris, and Battle). Gee, in the consideration of the inflammation of the parotid as complicating the various fevers, regards it as being caused by the dryness of the mouth, the irritation being assumed to extend from the mouth along Stenson's duct to the gland. Next to the dryness of the mouth the stagnation of the saliva may be said to constitute the most favorable factor for an ascending infection along Stenson's duct.

The conditions under which a patient is placed subsequent to the operation may well be considered as powerful contributory factors in the causation of parotitis. The feverish condition often following operations, by reducing the quantity of secretion, leads to a still further stagnation of the saliva within the glands and ducts. The failure to clean the teeth in the first few days following the operation may also act as a contributory cause. Thus in 2 cases reported by Malcolm the opening of Stenson's duct was visibly inflamed when attention was first directed to the gland, and in both cases carious teeth were situated opposite the opening of Stenson's duct. Hawthorne noted this early infection of the duct, stating that from the very earliest appearance of parotitis, pressure over the duct would cause the expulsion of a drop of pus from its orifice.

The histological investigation of Hannau in several fatal cases complicated by parotitis also bears out this view that an ascending infection from the mouth is the primary and direct cause of this affection. Paget at once refuted this theory, advancing as the most patent argument against it that the socia parotidis were never inflamed before the main body of the gland. This objection seems, however, not to be of great value, as clinically it must be difficult to establish an inflammation of such a small portion of the gland. Its attendant enlargement can be but slight, and the pain upon palpation cannot probably be so accurately localized as to enable us to say whether it is in this part or the anterior portion of the gland proper. Moreover, as has been determined histologically and clinically, inflammation of Stenson's duct precedes that of the parotid gland, so that the refutation of Paget may be considered as resting on insufficient or faulty observations.

One of the possible contributory causes not heretofore mentioned is the injury to the gland or duct, which may occur during the administration of anæsthesia. In the various manipulations of the face, as in the forward action of the mandible, the traction of the tongue or the removal of the accumulated secretion of the mouth, the duct may be easily compressed. A somewhat severe compression might at times result in slight injury, such as contusion of Stenson's duct, a locus minoris resistentiæ be thereby established, which, either singly or in conjunction with the dryness of the mouth and stagnation of saliva, would prepare a favorable field for a parotid infection. Occlusion of the duct at its most constricted portion, the papilla, which is situated opposite to the second upper molar tooth, would, similarly, be at times the result of this manipulation in the course of the anæsthesia. That these injuries of the duct favor the development of a parotitis is maintained in the cases reported by Johnson, in which the only cause that could be ascertained was an inflammation of the duct, with stagnation of the salivary secretion. Similar cases have been reported by Choppell, Battle, Kussmaul, and others. In several of these cases it was noted that pressure over the duct or gland relieved the swelling, and it was found that the pressure caused the expulsion of a plug of thick, turbid mucus from the duct, thus relieving the obstruction to the escape of saliva.

The various theories which have been advanced to explain the occurrence of postoperative parotitis may be stated as follows:

1. A sympathetic or nervous connection between certain viscera, notably the ovary and the parotid gland.
2. Metastasis.
3. Direct infection of the gland by way of Stenson's duct.

The theory of a sympathetic relation is not only entirely hypothetical, but extremely improbable. It is based for the greater part on a collection of facts having little apparent relation to each other, except that in all the parotid gland is involved, and there seems to be no relation other than that indefinite one termed reflex, which may not only take place after operations and injuries of various organs, but as the result of psychical emotions. Similar or identical reflex disturbances are also encountered in other gland structures, and are not, therefore, confined to the parotids. It is known, for instance, that in the emotion of fear the secretion of the parotid gland is inhibited, and in surgical shock also the flow of saliva is in part arrested. In neither of these, however, is the parotid gland alone involved. If shock is of any duration all glandular structures are said to be similarly involved. The increased salivation of pregnancy cannot be directly attributed to the uterus. It is more likely the consequence of the general condition. The statement that in camels the parotid glands enlarge during the breeding season may be included under this explanation. The functional alterations in the parotid secretions after operations, if it occur, is of temporary duration, so that it is doubtful whether as such it could favor inflammation.

The clinical observations of the occurrence of orchitis following mumps might possibly be explained by the theory that the causative agent was transferred accidentally by the hand from the mouth to the urethera, thence to the vas deferens, and finally involving the testicle. The occurrence of parotitis following catheterization attended by pain and fear might be due to the psychical effect which temporarily inhibited the secretion of saliva, and thus favored infection, but it could scarcely be more than a contributing agent, and, therefore, the role of sympathy in the production of inflammation of the parotid should be excluded.

That metastasis may and sometimes does occur in the parotid gland cannot be denied, especially in pyæmic or septicæmic cases, but it seems hardly probable that the parotid alone should be involved, while all the other organs of the body and more frequent sites of metastatic deposits should escape. So that while in single instances this metastasis may be assumed to have occurred, we cannot insist upon this being the universal or even common cause.

Direct infection, in the light of modern pathology and from the clinical study of many cases, would seem to be the only tenable theory, and while no doubt a large percentage of these infections occur primarily in Stenson's duct, the known fact that many pathogenic bacteria are cast off through the salivary glands make it not improbable that the locus minoris resistentiæ having been prepared by the dryness of the mouth, the stagnation of saliva, the inactivity of the masticatory muscles from the enforced liquid diet, or from possible injury to the duct or gland in operation, the bacteria may develop directly in the parotid, even while the duct is the site of an inflammation derived from bacteria within the buccal cavity.

PROGNOSIS. So far as may be judged from the few reported cases of parotitis following appendicitis, this complication is not to be considered a serious one or one likely to lead to any grave results, obviously very different from those rare cases of pyæmia, with coincident involvement of the parotid.

TREATMENT. The treatment must be regarded as (1) prophylactic and (2) surgical. The prophylactic treatment consists in attention to the buccal cavity, frequent cleansing of the teeth, washing out the mouth with a mild antiseptic, such as boric-acid solution, freeing the tongue so far as possible from the foul deposit which so often accumulates upon it, and in the cases in which stomach-feeding has been interdicted, giving the patient something to chew, so as to bring into action the masticatory muscles, and not only help in this manner to evacuate Stenson's duct of the accumulated mucus, but in a mild way stimulate the salivary secretion. Where not objectionable to the patient, chewing-gum might prove the most suitable agent. It might be proper, again, to call attention to the possibility of injuring the duct or gland by external manipulation, especially during the administration of an anæsthetic.

The surgical treatment consists in the application of heat or cold in the hope of checking the inflammation, but where pus is obviously present, nothing remains but to evacuate and drain, and a satisfactory recovery may be confidently anticipated.

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NASAL SYPHILITIC TUMORS.

By Max Toeplitz, M.D.,
of New York.

The tertiary manifestations of syphilis, in the nose the most frequent, are often seen very early—a few months to one year after the first infection, but, as a rule, much later. The tertiary lesions of hereditary lues are the same as those of the acquired, and occur either soon after birth or during puberty.

The anatomical lesion is a gummous infiltration of the mucous membrane, independent affection of cartilage, periosteum and bone, and simple infiltration, with softening, ulceration, either from without inward or inversely. The favorite seat of the infiltration is the septum, particularly on the boundary line between the quadrilateral cartilage and the perpendicular lamina of the ethmoid, bilaterally, often as the only sign; but it also occurs on other places of the septum, rarely on the lateral nasal wall, the turbinates first, but most frequently on the septum and nasal floor.

The tumors are either extremely large gummata or so-called granulomata. Such a syphiloma occurred in a woman, aged twenty-six years, an inmate of the Montefiore Home, who suffered from obstruction of the left nostril, formation of thick crusts, loss of sense of smell, and severe epistaxis. In the right nostril the most anterior portion of the lower turbinate covered with fibrinous deposits was seen only, owing to a deviation of the septum. The left nostril was obstructed by a gray, reddish, movable, smooth tumor, which was removed piecemeal with the cold snare, with much hemorrhage. It sprang from the upper portion of the bony septum, viz., from the upper raised boundary of a perforation, through which the tumor disappeared into the right nostril. The interior of the nose was covered with thick, foul-smelling, green-gray, adhesive crusts. The middle turbinate was atrophied. The histological examination, made by Dr. Henry Kreuder, revealed the body of the growth to consist of loose fibrous connective tissue covered in places by epithelium of the stratified columnar variety. The epithelium dipped